AKTIVITAS ANTIINFLAMASI EKSTRAK TEH HIJAU (*Camellia sinensis)* PADA TIKUS MODEL *Acute Respiratory Distress Syndrome* YANG DIINDUKSI LIPOPOLISAKARIDA

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Sebuah Skripsi yang diajukan untuk memenuhi salah satu syarat memperoleh gelar Sarjana Sains pada Fakultas Pendidikan Matematika dan Ilmu Pengetahuan Alam

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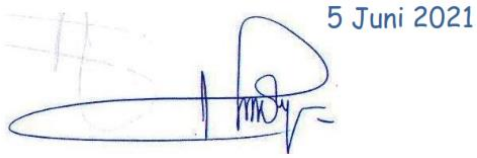

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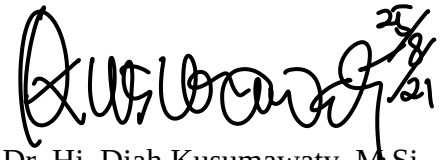

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ABSTRAK

Paru-paru adalah salah satu target patologis utama dari bakteri dan virus. *Acute Respiratory Distress Syndrome* (ARDS) merupakan sindrom cedera paru akut akibat infeksi patogen dengan tanda kegagalan napas yang mengakibatkan inflamasi berat dan disfungsi organ yang cepat. Sitokin TNF-α dan IL-18 ditemukan tinggi pada ARDS. Epigalokatekin galat dalam teh hijau telah banyak dilaporkan memiliki aktivitas antiinflamasi dan antioksidan yang cukup tinggi. Penelitian ini dilakukan untuk mengetahui potensi ekstrak teh hijau (*green tea extract,* GTE) sebagai antiinflamasi pada tikus model ARDS. Tikus jantan *Sprague Dawley* diinduksi 5 µg/g BB lipopolisakarida sebagai hewan model ARDS setelah perlakuan GTE selama 28 hari dengan variasi dosis 50; 400; 800 mg/kg BB. Ekstrak dilanjutkan selama 14 hari, kemudian tikus dimatikan untuk menghitung kadar TNF-α dan IL-18 dari serum darah dan jaringan paru-paru menggunakan metode ELISA. Induksi LPS meningkatkan sitokin TNF-α sebesar 438.35 ± 51,65 pg/mL (serum darah) dan 10.70 ± 0,60 pg/mg (jaringan paru-paru) serta sitokin IL-18 sebesar 251.90 ± 5,52 pg/mL (serum darah) dan 5.01 ± 0,04 pg/mg (jaringan paru-paru). Ketiga dosis menurunkan ekspresi TNF-α dan IL-18 pada kedua sampel. Konsentrasi TNF-α terendah ditunjukan oleh dosis 800 mg/kg BB ($P<0,05$) sebesar 265.00 ± 15,52 pg/mL (serum darah) dan 6.54 ± 0,47 pg/mg (jaringan paru-paru) sementara dosis 400 mg/kg BB menyebabkan penurunan IL-18 yang tinggi ($P<0,05$) dengan konsentrasi sebesar 90.62 ± 2,76 pg/mL (serum darah) dan 2.70 ± 0,44 pg/mg (jaringan paru-paru). GTE menunjukkan efek antiinflamasi dengan menurunkan sitokin TNF-α dan IL-18 pada tikus model ARDS sehingga dapat menjadi sumber potensial untuk menanggulangi ARDS.

Kata Kunci: *Teh hijau, Sindrom Gangguan Pernafasan Akut, Antiinflamator, Lipopolisakarida, Sitokin pro-inflamasi*

ANTIINFLAMMATORY ACTIVITY OF GREEN TEA (*Camellia sinensis)* EXTRACT ON ACUTE RESPIRATORY DISTRESS SYNDROME RAT MODEL INDUCED BY LIPOPOLYSACCHARIDE

ABSTRACT

The lungs are one of the major pathological targets of bacteria and viruses. Acute Respiratory Distress Syndrome (ARDS) is an acute lung injury syndrome caused by pathogen infection that characterized by respiratory failure resulting severe inflammation and rapid organ dysfunction. TNF-α and IL-18 cytokines were found higher in ARDS. Epigallocatechin gallate in green tea has been widely reported to have high anti-inflammatory and antioxidant. This study was conducted to determine the potential of green tea extract (GTE) as an anti-inflammatory in ARDS rats. Sprague Dawley male rats were induced by 5 µg/g BW lipopolysaccharide as an ARDS animal model after 28 days of GTE treatment with a dose variation of 50; 400; 800 mg/kg BW. The extract was continued for 14 days, then the rats were killed to measure the levels of TNF-α and IL-18 from blood serum and lung tissue using the ELISA method. Induction of LPS increased TNF-α cytokines by 438.35 ± 51.65 pg/mL (blood serum) and 10.70 ± 0.60 pg/mg (lung tissue) also IL-18 cytokines by 251.90 ± 5.52 pg/mL (blood serum) and 5.01 ± 0.04 pg/mg (lung tissue). The three doses decreased the expression of TNF-α and IL-18 in both samples. The lowest TNF-α concentration was indicated by a dose of 800 mg/kg BW ($P<0.05$) of 265.00 ± 15.52 pg/mL (blood serum) and 6.54 ± 0.47 pg/mg (lung tissue) meanwhile dose of 400 mg/kg BW caused a high decrease in IL-18 ($P<0.05$) with concentrations of 90.62 ± 2.76 pg/mL (blood serum) and 2.70 ± 0.44 pg/mg (lung tissue). GTE exhibits anti-inflammatory effects by downregulating TNF-α and IL-18 cytokines in ARDS rat models so that it can be a potential source to overcome of ARDS.

Keywords: *Green Tea, Acute Respiratory Distress Syndrome, Antiinflammatory, Lipopolysacharide, Proinflamatory cytokine.*

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